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Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/W.No.08/RM/WMM/Gradation/2014-15

11.08.2014

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.

Agency : **Mr. R. Madhusudhan,** Contractor, Bangalore.

Name of Work : Pot Holes in Ward No. 08, Kodigehalli Sub Division, BBMP, Bangalore.

Reference : AEE/KH/194/2014-15 Dated: 05.08.2014

Date of Testing : 11.08.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **25400**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	980	980	3.9	96.1	95-100
22.4	6450	7430	29.3	70.7	60-80
11.2	5385	12815	50.5	49.5	40-60
4.75	4160	16975	66.8	33.2	25-40
2.36	3595	20570	81.0	19.0	15-30
0.600	2160	22730	89.5	10.5	8-22
0.075	2375	25105	98.8	1.2	0-8

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Job No.: CTCE/BBMP/W.No.08/RM/BC/Bitumen/2014-15 · 18.08.2014

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE
As Per IS 2386 and IRC:SP:11-1984

CLIENT	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. R. Madhusudhan,** Contractor, Bangalore.
NAME OF THE WORK	Pot Holes in Ward No. 08, Kodigehalli Sub Division, BBMP, Bangalore.
REFERENCE	AEE/KH/194/2014-15 Dated: 05.08.2014
SAMPLE I/D	Pot Holes in Ward No. 08
DATE OF TESTING	18.08.2014

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	474.5	474
3. Weight of Asphalt and Mineral matter Extracted, g	25.5	26
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	25.5	26
7. Bitumen content in %	5.10	5.20
8. Average	5.15	

GRADATION AFTER EXTRACTION

TABLE - 1

SIEVE SIZE	Percent Passing, %		JOBMIX
mm	Sample 1	Sample 2	Gradation
19	100.00	100.00	100
13.2	87.23	86.59	79-100
9.5	85.26	83.67	70-88
4.75	55.14	59.48	53-71
2.36	46.39	42.35	42-58
1.18	42.36	45.87	34-48
0.6	35.23	36.12	26-38
0.3	21.87	25.85	18-28
0.15	16.58	16.58	12-20
0.075	6.52	7.23	4-10

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Job No.: CTCE/BBMP/W.No.08/RM/WMM/AIV/2014-15 11.08.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Madhusudhan,** Contractor, Bangalore.
Name of the Work	Pot Holes in Ward No. 08, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/KH/194/2014-15 Dated: 05.08.2014
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	11.08.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	383	387	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	298	301	
4	Aggregate Impact value = percent fines	22.19	22.22	
	100* (W_2/W_1)%			22.21

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.08/RM/WMM/S-T/2014-15 11.08.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Madhusudhan,** Contractor, Bangalore.
Name of Work	Pot Holes in Ward No. 08, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/KH/194/2014-15 Dated: 05.08.2014
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	11.08.2014

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **12.65%**

Elongation Index = **13.92%**

Result : Combined Flakiness & Elongation index 26.57%

Comments:

→ Maximum allowable Flakinee & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.08/RM/BC/AIV/2014-15

18.08.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Madhusudhan,** Contractor, Bangalore.
Name of the Work	Pot Holes in Ward No. 08, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/KH/194/2014-15 Dated: 05.08.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	18.08.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	381	378	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	84	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	294	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	21.52	22.22	21.87

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.08/RM/BC/Shape_T/2014-15 : 18.08.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. R. Madhusudhan,** Contractor, Bangalore.
Name of Work	: Pot Holes in Ward No. 08, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	: AEE/KH/194/2014-15 Dated: 05.08.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Bituminous Concrete
Date of Testing	: 18.08.2014

Result : Flakiness Index = **12.87%**

Elongation Index = **15.43%**

Result : Combined Flakiness & Elongation index **28.30%**

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Job No.: CTCE/BBMP/W.No.08/RM/BC/Stripping/2014-15 18.08.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Madhusudhan,** Contractor, Bangalore.
Name of the work	Pot Holes in Ward No. 08, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/KH/194/2014-15 Dated: 05.08.2014
Type of Mix	Bituminous Concrete
Date of Testing	18.08.2014

Type of binder : 60/70
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.3	3.30	96.70
2	3.4		
3	3.2		

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.08/RM/BC/Sp_Wa/2014-15

18.08.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Madhusudhan,** Contractor, Bangalore.
Name of the Work	Pot Holes in Ward No. 08, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/KH/194/2014-15 Dated: 05.08.2014
Type of Mix	Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	18.08.2014

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2015	2017	2012	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1260	1262	1257	
4	Weight of saturated surface dry aggregate in air	W_3 g	2026	2022	2025	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	766	760	768	
6	Weight of oven dried aggregate	W_4 g	2010	2005	2008	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.624	2.638	2.615	2.626
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.680	2.699	2.674	2.684
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.80%	0.85%	0.85%	0.83%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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